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Technology Center 2100

In re application of:

Craig M. Jarchow

Serial No. 09/952,854

Filed: February 4, 2000

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Group Art Unit 2128

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Examiner: Day, Herng Der

Attorney Docket No. APA-001

Title: System for Estimating Thickness of Thin Subsurface Strata

Commissioner for Patents

P. O. Box 1450

Alexandria, Virginia 22313-1450

DECLARATION UNDER 37 C.F.R. 1.132

Dear Sir:

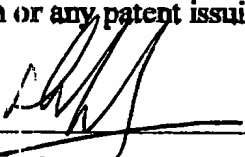
I, David J. Monk declare as follows:

1. I received a Bachelor of Science Degree in Physics from the University of Nottingham in 1976, and a Ph.D. in Physics from the University of Nottingham in 1980.
2. I have 28 years of experience in the seismic business, including both data acquisition and processing. I am currently employed by Apache Corporation, of Houston, Texas, the assignee of the above-captioned U. S. Patent Application, as Manager of Geophysics, with technical responsibility for worldwide geophysical activity, including seismic data acquisition and data processing.
3. A listing of patents on which I am either a sole or joint inventor, a listing of my published technical papers, and honors are attached.

4. I have read and understand US Patent 6,131,071, which issued to Partyka et al. on October 10, 2000. I have also read and understood US Patent Application Serial No. 09/498,012, having a filing date of February 4, 2000.

5. The disclosure in US Patent 6,131,071 (the "Partyka et al." patent) neither discloses nor suggests the invention disclosed and claimed in US Patent Application 09/498,012. With reference to claim 1 of US Patent Application 09/498,012, as presently amended, there are no teachings or suggestions in Partyka et al. of utilizing frequencies having the greatest amplitude within the frequency spectrum of seismic data to generate a seismic display, and utilizing this display to determine the presence of thin beds.

The undersigned declares further that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.



David J. Monk

10.14.04

Date

PATENTS:

"Dual Sensor Signal Processing Method for On-bottom Cable Seismic ", USA Patent 6,539,308.

"Dual Sensor Signal Processing Method for On-bottom Cable Seismic Wave Detection", USA Patent 6,314,371.

"Dual Sensor Signal Processing Method for On-bottom Cable Seismic Wave Detection", PCT (Patent Cooperation Treaty), Patent WO101170A1.

"Multimedia Techniques for Multidimensional Data Interpretation", PCT (Patent Cooperation Treaty), Patent WO101350A1.

"An Interpolation Method for Aliased Noisy Seismic Data", USA Patent 5,235,556.

"Method for Attenuating Undesirable Data, such as Multiples, using Constrained Cross-Equalization", USA Patent No 5,309,360.

"A Noise Attenuation Method", USA Patent No 5,138,583.

"Processing Method for Marine Seismic Surveying Utilizing Dual Streamers", USA Patent No 4,937,793.

PUBLISHED TECHNICAL PAPERS:

Non Seismic Related:

1. **"Microwave Acoustic Relaxation Losses in MgO due to Fe²⁺",** Journal of Physics C: Solid State Physics. (1978)
2. **"APR and Acoustic Relaxation of Fe²⁺:KMgF₃",** Proceedings of 6th International Acoustic Symposium. Grenoble (1978)
3. **"Anomalous Acoustic Relaxation Absorption and Acoustic Paramagnetic Resonance in KMgF₃ Containing Fe",** Acta Physica Slovaca. (1979)
4. **"Microwave Acoustic Relaxation Due to Ni³⁺ Ions in Al₂O₃",** Proceedings of the 3rd International Conference on Phonon Scattering in Condensed Matter. (1979)
5. **"Phonon Spectroscopy on Mn³⁺ in MgO",** Proceedings of the 3rd International Conference on Phonon Scattering in Condensed Matter. (1979)
6. **"The Photoconductivity of Cr-doped GaAs: Dynamic Effect, Some Recent Measurements",** Proceedings of 7th International Acoustic Symposium. Nottingham (1979)
7. **"The Origin of the Acoustic Relaxation Peak Associated with Cr in GaAs",** Proceedings of 7th International Acoustic Symposium. Nottingham (1979)
8. **"Investigations of Cr in GaAs using Phonons",** Proceedings of the International Conference on Semi-Insulating III-V Materials. (1980)
9. **"Ni³⁺ in Al₂O₃: An Acoustic Relaxation Study",** Journal of Physics C: Solid State Physics. (1980)

Seismic Related:

1. **"Streamer Noise Mechanisms"**, Proceedings of the Inaugural SEG Gulf Coast Exploration and Development Meeting, Houston, Texas (1985)
2. **"The Development of Low Noise Digital Streamers"**, Proceedings of 48th Annual EAEG Conference, Ostend, Belgium (1986)
3. **"The Development of Low Noise Streamers in Marine Seismic Data Collection"**, Proceedings of XVI Annual NOFTIG meeting, Trondheim, Norway. (1987)
4. **"Limitations of Dip Moveout (DMO) in Seismic Data Processing"**, Proceedings of XVI Annual NOFTIG meeting, Trondheim, Norway. (1987)
5. **"Titan 1000: A Second Generation Marine Digital Streamer System"**, Proceedings of 49th Annual EAEG Conference, Belgrade. (1987)
6. **"Seismic Data: Resolution in Display"**, Proceedings of NPF Biannual Geophysical Seminar, Kristiansand, Norway. (1988)
7. **"Resolution of Seismic Velocities"**, Proceedings of NPF Biannual Geophysical Seminar, Kristiansand, Norway. (1989)
8. **"Wavefield Separation of Twin Streamer Data"**, Proceedings of 51st Annual EAEG Conference, Berlin. (1989)
9. **"Frequency Dispersion in Finite Difference Migration"**, Proceedings of 51st Annual EAEG Conference, Berlin. (1989)
10. **"Wavefield Separation of Twin Streamer Data"**, First Breaks. (Feb. 1990)
11. **"Noise Attenuation in Seismic Data"**, Proceedings of NPF Biannual Geophysical Seminar, Kristiansand, Norway. (1990)
12. **"Statistical Evaluation of Air-Gun Array Performance"**, Proceedings of 60th Annual SEG Meeting San Francisco. (1990)
13. **"Wave Equation Multiple Suppression Using Constrained Cross-Equalization"**, Annual Meeting of the Canadian SEG (1990)
14. **"Wave Equation Multiple Suppression Using Constrained Cross-Equalization"**, Proceedings of 53rd Annual EAEG Conference, Florence. (1991)
15. **"Modeling Air-Gun Array Performance Specifications"**, Proceedings of 53rd Annual E.A.E.G. Conference, Florence. (1991)
16. **"Wave Equation Multiple Suppression Using Constrained Cross-Equalization"**, SBG - Sociedade Brasileira de Geofísica (Brazilian Geophysics Society). (1991)
17. **"Wave Equation Multiple Suppression Using Constrained Cross-Equalization"**, Proceedings of 61st Annual SEG Meeting, Houston. (1991)
18. **"Seismic Noise Attenuation and Preservation of Amplitude"**, 1992 Continuing Education program SEG, Oklahoma City. (1992)
19. **"An Approach to Optimizing the Tau-P Transform"**, Proceedings of Annual Gulf Coast SEG Conference, Houston. (1992)

20. **"An Approach to Optimum Slant Stack, Its Application as a Noise Attenuator"**, Proceedings of 54th Annual EAEG Conference, Paris. (1992)
21. **"Effects of Air-Gun Firing Time Variations on Signal Stability"**, Proceedings of 54th Annual EAEG Conference, Paris. (1992)
22. **"An Approach to Optimum Slant Stack and Its Application as a Noise Attenuator"**, Proceedings of 62nd Annual SEG Meeting, New Orleans. (1992)
23. **"3D Time Variant Dip Moveout by the FK Method"**, Proceedings of the 11th Annual Egyptian Petroleum Exploration/Production Conference. (1992)
24. **"Wave Equation Multiple Suppression Using Constrained Cross-Equalization"**, Proceedings of the 11th Annual Egyptian Petroleum Exploration/Production Conference. (1992)
25. **"Seismic Noise Attenuation Using the "Radon" Method"**, and Preservation of Amplitude", Proceedings of the 11th Annual Egyptian Petroleum Exploration/Production Conference. (1992)
26. **"Prediction Filtering for 3D Post Stack Data"**, Proceedings of the 10th Annual Petroleum Congress and Exhibition of Turkey. (1993)
27. **"The Effect of Navigation Errors on Seismic Data"**, Proceedings of the 55th Annual EAEG Conference, Stavanger. (1993)
28. **"Prediction Filtering for 3-D Post Stack Data"**, Proceedings of the Annual Gulf Coast S.E.G. Conference, Houston. (1993)
29. **"In field Assessment of Seismic Data in Relation to Processing Objectives"**, Proceedings of the SEG Summer workshop (3D seismology : Integrated comprehension of large data volumes), Rancho Mirage, California (1993).
30. **"Wave Equation Multiple Suppression Using Constrained Cross-Equalization"**, Geophysical Prospecting. Vol. 41 pp. 725-736 (1993)
31. **"An Approach to Optimum Slant Stack, Its Application as a Noise Attenuator"**, First Breaks. (1993)
32. **"Prediction Filtering for 3D Poststack Data"**, Proceedings of the 63rd Annual SEG Conference, Washington (1993).
33. **"Random and Systematic Navigation Errors: How do they Affect Seismic Data Quality"**, Proceedings of the 63rd Annual SEG Conference, Washington (1993).
34. **"A Total Quality Management Approach to Assessment of the Distribution of 3D Seismic Data"**, Proceedings of the NPF Biannual Geophysical Conference : The 3D Seismic Challenge, Kristiansand, Norway (1994).
35. **"Random and Systematic Navigation Errors : How do they Affect Seismic Data Quality"**, Proceedings of the NPF Biannual Geophysical Conference : The 3D Seismic Challenge, Kristiansand, Norway (1994).
36. **"Evaluation of Sea Bottom Features from Seismic Calibration Data : A Case History"**, Proceedings of the SEG/EGS Cairo '94 Pan African/Middle East Exploration and Development Conference (1994).

37. **"Evaluation of Sea Bottom Features from Seismic Calibration Data : A Case History"**, Proceedings of the 56th Annual EAEG Conference, Vienna (1994).
38. **"Integrated Analysis of Geometry Dependent Seismic Wavelet Reliability"**, Proceedings of the 56th Annual EAEG Conference, Vienna (1994).
39. **"Evaluation of Sea bottom features from Seismic Calibration Data : A Case History"**, Proceedings of the 64rd Annual S.E.G. Conference, Los Angeles (1994).
40. **"Evaluation of Sea bottom features from Seismic Calibration Data : A Case History"**, Invited paper : Proceedings of the 10th Annual S.E.G. Gulf Coast Exploration and Development Meeting, Houston, Texas (1995)
41. **"Model based 3D seismic survey design"**, Proceedings of the 57th Annual E.A.E.G. Conference Glasgow (1995)
42. **"An evaluation of seismic data compression on the interpretability of the final product"**, Proceedings of the 57th Annual E.A.E.G. Conference Glasgow (1995)
43. **"Acquisition of a bottom cable 3D seismic survey, offshore Dubai, UAE - A case history"**, Proceedings of the 57th Annual E.A.E.G. Conference Glasgow (1995)
44. **"DMO implications for 3D survey design"**, Proceedings of the 65th Annual S.E.G. Conference Houston (1995)
45. **"DMO Illumination variations due to 3D geometry"**, Proceedings of the 58th Annual E.A.E.G. Conference Amsterdam (1996)
46. **"Spatial Interpretation of 3D seismic project specifications : An effective way to reduce costs"**, Proceedings of the 1st International Indonesian Geophysical conference Jakarta (1996)
47. **"DMO implications for 3D survey design"**, Proceedings of the 1st International Indonesian Geophysical conference Jakarta (1996)
48. **"Effect of 3D survey irregularities on amplitudes in 3D time slices(acquisition footprint in 3D seismic surveys)"**, Proceeding of 65rd Annual S.E.G. Conference, Denver (1996).
49. **"Spatial Interpretation of 3D Marine Seismic Project Specification, An effective way to reduce costs"**, OTC (1997)
50. **"Survey geometries that achieve uniform offset and azimuth sampling," EAEG (1997).**
51. **"Spatial Interpretation of 3D Seismic Project Specification, An effective way to reduce cost," EAEG (1997)**
52. **"3D Survey Design to Avoid DMO Processing Artifacts"**, Proceedings of SEISMIC '97 the 6th International Conference.
53. **"High-resolution 3-D: New Focus for an existing tool"**, World Oil May 1997.
54. **"Current and Future Development and Application of 3D Time Lapse seismic (4D)"**
Invited lecture: Annual meeting of the Society of Explorationists in the Emirates. (1997)
55. **"Considerations in Development and Application of 4D seismic data"**, Proceedings of the SEG/EGS conference, Cairo, Egypt (1998)

56. **"Sea Floor Dynamics in an Ocean Bottom Environment"**, Proceeding of I-O Sensor workshop, Norwich (1998).
57. **"Pitfalls in Seismic Acquisition"**, Proceeding of 67th Annual S.E.G. Conference (Pitfalls Workshop), New Orleans (1998).
58. **"3D Design problem: some more questions and answers"**, (1999) Annual E.A.E.G. convention Helsinki June.
59. **"The Challenges of 4D – The Feasibility Study"**, Proceedings of the Annual NPD conference Norway (1999)
60. **"3D Survey Design: The business of Cost Reduction"** Proceeding of 68th Annual S.E.G. Conference (Land Acquisition Workshop), Houston (1999).
61. **"3D Survey Design: A solution"**, First Break Vol 18 no. 5, May (2000).
62. **"The Value of Low Frequency"**, Proceeding of I-O Sensor workshop, Norwich (2001).
63. **"High Altitude Weight Drop Source"**, Oil and Gas Journal Vol 99.37 Sept 10th (2001).
64. **"Bombs Away"**, Apache Corporation ARROWS Vol 31 Issue 1 January (2002).
65. **"High Altitude Weight Drop"**, Proceeding of I-O Sensor workshop, Norwich (2002).
66. **"Lena: A seismic Model"**, The Leading Edge, Vol 21 No.5, May (2002).
67. **"Canadian Seismic with aThump"**, Proceeding of the Annual C.S.E.G. Conference, Calgary (2002).
68. **"Canadian Seismic with aThump"**, Recorder, Vol 27 No 5, May (2002).
69. **"Implementing technology with efficiency: A case history of 3D seismic in Egypt."** Proceedings of the AAPG conference Cairo 2002.
70. **"Passive Seismic.. Listen: is it the next big thing?"** Interview by Louise Durham for the AAPG Explorer April (2003)

ADDITIONAL HONORS:

Recipient of Canadian Society of Exploration Geophysicists (CSEG) Best Paper Award "Extreme Geophysics" 2002.

Recipient of Hagedoorn Award in 1994 from European Association of Exploration Geophysicists (EAEG), for contributions to Geophysics.

Recipient of Society of Exploration Geophysicists (SEG) Best Paper Award, 1993

Session Chairman for Annual SEG Conference, 1993, 1992 and 1991

Session Chairman for Annual EAEG Conference, 1992, 1991 and 1990

Served on the 1992 SEG Technical Committee as the representative for "Seismic Processing", and as workshop co-ordinator for various workshops since then.

External Referee, for MSc thesis at the University of Houston Allied Geophysical Lab.

Technical Program Chairman, 2005 Society of Exploration Geophysicists Annual Meeting